

90. *The Upper Cretaceous Ammonites So-called Hamites in Japan.*¹⁾

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The generic name *Hamites* was proposed by J. Parkinson in 1881; the genotype is *Ammonites attenuatus* Sowerby from the Albian. Later considerable number of species have been assigned to the genus; these include many types different from its typical Albian forms. This confusion is partly due to the difficulty of obtaining complete individual specimens preserving parts of shell in all growth-stages.

Several species of *Hamites* (s. l.) have been recorded from the Upper Cretaceous of Japan; they are separable into the following 4 genera:

Polyptychoceras Yabe.

Genotype: *Anisoceras pseudogaultinum* Yokoyama, Palaeontographica, XXXVI, 1890, 181, pl. XX, figs. 1-3.

Shell Hamitid, consisting of elongated 3 or more reflected whorls, round or dorso-ventrally oval in cross-section; early whorls contiguous, encircled by numerous fine transverse ribs and periodic constrictions, which are oblique forwards, the later ones separate from each other, flattened on the dorsal and there provided with weak concentric transverse ribs. Suture-lines with 3 saddles and corresponding lobes, both bifid; antisiphonal lobe shallow, narrow and trifid.

P. pseudogaultinum (Santonian), *haradanum* (Campanian), *subquadratum* (Campanian), and *mihoense*, sp. nov. (Campanian) are from Japan.

Subptychoceras, gen. nov.

Genotype: *Hamites (Polyptychoceras) yubarensis* Yabe, Sci. Rep. Tōhoku Imp. Univ., Ser. 2, vol. XI, No. 1, 1927, p. 44 (=*Hamites* sp., Jimbo, Pal. Abh., N.F., Vol. XI, 1894, p. 39, pl. VII, fig. 6).

Like *Polyptychoceras*, but with ornamentation of different type which consists of numerous broad, flat transverse folds, each with 2 or 3 fine ribs.

The genotype is from the Campanian of Japan; *Ptychoceras vancouverense* Whiteaves²⁾ from the Senonian of Vancouver and *Anisoceras subundulatum* Yokoyama³⁾ from the Campanian of Japan may belong to this genus.

Diplomoceras Hyatt.

Genotype: *Hamites cylindraceus* Defrance.

Shell Hamitid, once reflected; arms separated; both round or laterally compressed in cross-section; ribs numerous, transverse and completely encircle the whorls; suture-lines as in *Polyptychoceras*, but with much more complex incision.

Hyatt⁴⁾ established this genus without description, merely enumer-

1) I wish to express my cordial thanks to the authorities of the British Museum (Natural History) for their kind hospitality and assistance given me during my short visit there.

2) Whiteaves, F.: Mesozoic Fossils, I, No. 2. Geol. Surv. Canada, 1879, p. 113, pl. XIV, fig. 3.

3) Yokoyama: l.c., p. 183, pl. XX, figs. 6-7.

4) Hyatt, A. in Zittel -- Eastman: Text-Book of Palaeontology, 1900, p. 571.

ating *H. cylindraceus* as the genotype. The above lines describe the essential features of the genotype. *Hamites obstrictus* Jimbo from the Maestrichtian of Japan belong to this genus.

Glyptoxoceras Spath emend.

Genotype: *Hamites (Anisoceras) indicus* (Forbes) Kossmat, Beitr. Pal. Osterr.-Ung., Vol. IX, 1895, p. 145, pl. XIX, figs. 4 a, b, non 4 c. *H. (A.) rugatus* in Kossmat, ibid., p. 146, pl. XIX, figs. 7-9.

Young whorls helicoidal, round or elliptical in cross-section; Hamitid in later growth, disjunct, prolonged, and reflected; suture-lines as in *Polyptychoceras* but with asymmetrically bifid antisiphonal lobe.

Spath¹⁾ proposed the genus without description and chose *H. (A.) rugatus* (Forbes) Kossmat as its genotype. However, that species is a synonym of *H. (A.) indicus* (Forbes) Kossmat, and the genotype becomes *H. (A.) indicus*. The above description is based on the paragenotype.

Forbes's *Anisoceras rugatum*,²⁾ *indicum*,³⁾ and *subcompressum*⁴⁾ had been misleading to subsequent authors; the opportunity I had in examining the type specimens of Forbes in the British Museum through the kindness of Dr. L. F. Spath, led to the following.

Forbes in establishing *A. indicum* selected as its holotype a specimen quite identical with his *A. subcompressum* as already pointed out by F. Kossmat.⁵⁾ Stoliczka fell into the same error, resulting in his *A. indicum*⁶⁾ becoming a synonym of *A. subcompressum*. Kossmat, who examined the type specimens of Forbes, figured a specimen (B.M. 10498) as *Hamites (Anisoceras) indicus*, this is now taken as the paratype of *Glyptoxoceras indicus*. He⁷⁾ also erroneously considered the holotype of *A. rugatum* (B.M. 1049) to belong to *A. subcompressum* and figured 3 cotypes (B.M. 10501) selected from Kaye and Cunliffe's collection under the latter name. The specimens figured by Kossmat as *G. rugatum* are, obviously different from Forbes' *G. rugatum* in having finer ribs, but so similar to his own figures of *G. indicum* that I was at first sight lead to the belief that they actually belong to *G. indicum*.

Stoliczka's *A. subcompressum*⁸⁾ differs markedly from the holotype of *G. subcompressum* (B.M. 10491) in round outline of whorls and from the paratype of *G. indicum* in coarser ribs; in such distinctions it may now be named *G. circulare* (the holotype, B.M. 83624). The suture-line⁹⁾ figured by Kossmat as *G. indicum* was drawn from a small specimen (B.M. 10497) which, I believe, belongs to *G. circulare*. Stoliczka's *A. rugatum*¹⁰⁾ is not a true *rugatum* but a transitional form between *G. circulare* and *G. indicum*, it may be distinguished as *G. circulare* var. *intermedia* nov.

1) Spath, L. F.: Geol. Mag. London, Vol. LXII, 1926, p. 30.

2) Forbes, E.: Trans. Geol. Soc. London, Ser. 2, Vol. VII, 1845, p. 117, pl. XI, fig. 4.

3) Forbes: ibid., p. 116, pl. XI, fig. 4.

4) Forbes: ibid., p. 116, pl. XI, fig. 6.

5) Kossmat: l.c., p. 145.

6) Stoliczka, F.: Pal. Indica, I, 1865, p. 181, pl. LXXXV, figs. 1-5.

7) Kossmat: l.c., p. 145.

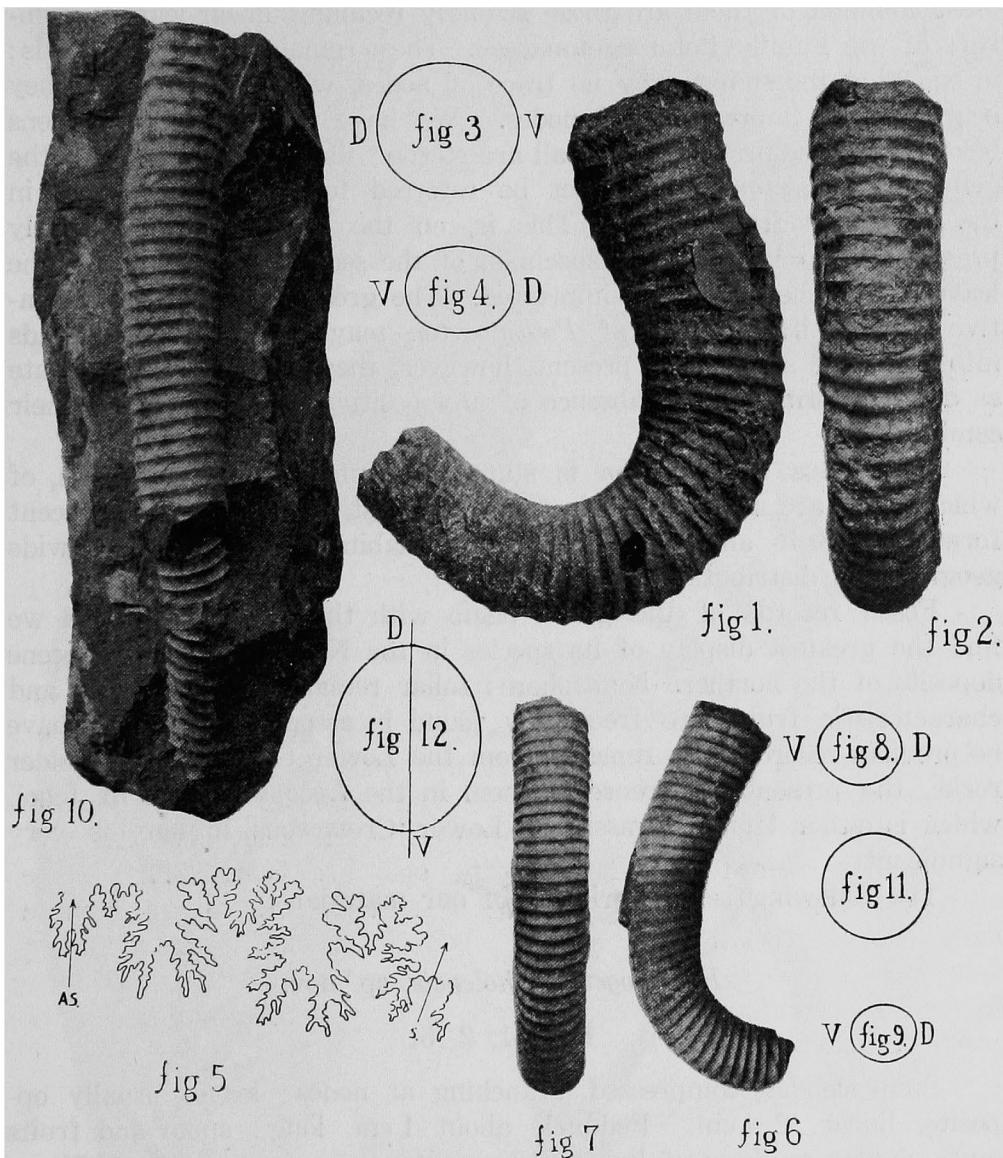
8) Stoliczka: l.c., p. 179, pl. LXXXV, fig. 4.

9) Kossmat: l.c., pl. XIX, fig. 4 c, non 4 a, b.

10) Stoliczka: l.c., p. 178, pl. LXXXV, figs. 10-13.

The holotype of *G. rugatum* is refigured (Figs. 1-5) since the original by Forbes is too diagrammatic and had been misleading; characteristic are its whorl-shape, ribbing and suture-lines.

The following 5 species of *Glyptoxoceras* are from the Maestrichtian of Japan: *obliquecostatum* (Jimbo), cfr. *rugatum* (Forbes), cfr. *indicum* (Forbes), cfr. *subcompressum* (Forbes), (?) *nipponicum* sp. nov. The last species is close to *G. circulare* in whorl-shape, but the ribs are somewhat coarser. *Hamites* sp. (Jimbo, l.c., pl. VII, fig. 7), which is sometimes included in *G. largesulcatus* (Forbes) (fig. 2, B.M. 10498), with characteristic elliptical whorl-shape, may belong to this species.



(All from the Valudayur Beds of South India.)

Figs. 1-9. *Glyptoxoceras rugatum* (Forbes). 3-4, whorl-section at posterior and anterior ends of Holotype. 8-9, same of Cotype. Fig. 5 $\times 2$.

Figs. 10-11. *G. circulare* sp. nov. 11, whorl-section at posterior end of Holotype.

Fig. 12. *G. subcompressum* (Forbes). Whorl-section at posterior end of Holotype.